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Search History

DATE: Thursday, October 13, 2005 <u>Printable Copy</u>   <u>Create Case</u>

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END OF SEARCH HISTORY

L8: Entry 11 of 13   File: USPT   Sep 30, 2003

US-PAT-NO: 6629081
DOCUMENT-IDENTIFIER: US 6629081 B1
** See image for Certificate of Correction **

TITLE: Account settlement and financing in an e-commerce environment

DATE-ISSUED: September 30, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Cornelius; Richard D.	Santa Monica	CA		
Stepniczka; Andreas	San Francisco	CA		
Chu; Kevin	Atlanta	GA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Accenture LLP	Palo Alto	CA			02

APPL-NO: 09/470023   [PALM]
DATE FILED: December 22, 1999

INT-CL: [07] G06 F 17/60

US-CL-ISSUED: 705/30
US-CL-CURRENT: 705/30

FIELD-OF-SEARCH: 705/30, 705/34, 705/39, 705/40

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected | Search ALL | Clear

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☐	4799156	January 1989	Shavit et al.	
☐	4823264	April 1989	Deming	705/39
☐	5168444	December 1992	Cukor et al.	
☐	5704045	December 1997	King et al.	
☐	5717989	February 1998	Tozzoli et al.	
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☐	5809144	September 1998	Sirbu et al.	
☐	5826241	October 1998	Stein et al.	

☐	5832460	November 1998	Bednar et al.	705/27
☐	5848400	December 1998	Chang	
☐	5878403	March 1999	DeFrancesco et al.	
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☐	5903878	May 1999	Talati et al.	
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☐	6032133	February 2000	Hilt et al.	705/40
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FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
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http://www.carsdirect.com/the.sub.- company/cdc.sub.- advantage.
eBay Incorporated, "Feedback Overview", Dec. 1998.

ART-UNIT: 3627

PRIMARY-EXAMINER: Olszewski; Robert P.

ASSISTANT-EXAMINER: Fischer; Andrew J.

ATTY-AGENT-FIRM: Oppenheimer Wolff & Donnelly LLP

ABSTRACT:

A system, method and article of manufacture are provided for account settlement utilizing a
network. First, a buyer is allowed to select from a group of options in order to settle an
account utilizing a network. The options include settling a minimum balance, partially
settling, settling a full balance, and applying for an import loan on payment due date. The
selected option is then received utilizing the network. Finance interest may then be booked
against the buyer for an unpaid portion of the account if the selected option includes either
settling a minimum balance or partially settling. If the selected option includes settling a
full balance, the account may be reconciled. On the other hand, if the selected option includes
applying for an import loan on payment due date, an import loan may be booked and a credit line
may be transferred to a trade loan line.

18 Claims, 112 Drawing figures

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L8: Entry 13 of 13   File: USPT   Dec 10, 2002

US-PAT-NO: 6493682
DOCUMENT-IDENTIFIER: US 6493682 B1

TITLE: Optimal order choice: evaluating uncertain discounted trading alternatives

DATE-ISSUED: December 10, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Horrigan; Holly T.	Raleigh	NC		
Wald; John K.	Hoboken	NJ		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Pendelton Trading Systems, Inc.	Hoboken	NJ			02

APPL-NO: 09/396647   [PALM]
DATE FILED: September 15, 1999

PARENT-CASE:
This application claims the benefit of U.S. Provisional Application No. 60/100,381, filed Sep. 15, 1998.

INT-CL: [07] G06 F 17/60

US-CL-ISSUED: 705/36; 705/36, 705/35, 705/37
US-CL-CURRENT: 705/36R; 705/35, 705/37

FIELD-OF-SEARCH: 705/35, 705/36, 705/37

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

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	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	5819237	October 1998	Garman	705/36
☐	6078904	June 2000	Rebane	705/36

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FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
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Simaana, Yusif, Daniel G. Weaver, and David K. Whitcomb, 1998. The Quotation Behavior of ENCS and Nasdaq Market Makers, Fordham University working paper.

ART-UNIT: 3624

PRIMARY-EXAMINER: Millin; Vincent

ASSISTANT-EXAMINER: Kyle; Charles R.

ATTY-AGENT-FIRM: McDonnell Boehnen Hulbert & Berghoff

ABSTRACT:

The present invention provides a method for determining whether to execute an order (or list of orders) immediately, or delay execution in exchange for a possible price savings. The method's generality enables the investor to optimize order decisions given individual beliefs about expected security returns and variance, risk aversion, and portfolio investment goals. Starting from an expected utility framework, the method maximizes the expected gains associated with trading. The method encompasses the case in which the investor plans to trade the security within a specified trading window as well as the case in which trading occurs only at attractive prices. Additionally, under the assumption of constant absolute risk aversion, the method resembles a traditional mean-variance analysis commonly used in equity portfolio management. The method also generalizes to handle the case of multiple orders and enables an investor to consider an order strategy taking overall portfolio risk into account. The method also can be used in conjunction with dynamic cost control techniques.

The method of the invention is the first such method to consider the maximization of gains in an order context as a function of both returns and the probability of the order being executed. This method is also unique in that it simultaneously accounts for the opportunity costs and the adverse selection costs of using discounted, uncertain orders such as equity limit orders, POSIT.RTM. trades, equity principal order trading, etc.

31 Claims, 0 Drawing figures

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DOCUMENT-IDENTIFIER: US 6493682 B1
TITLE: Optimal order choice: evaluating uncertain discounted trading alternatives

Brief Summary Text (5):
An investor choosing to place a purchase limit order may not receive execution if the price
rises, but will receive execution if the price falls sufficiently. The investor misses some of
the gains and suffers more of the losses. However, in noisy or mean-reverting markets, limit
orders may provide superior returns by reducing the costs of execution. Thus, limit order
trading involves the risk of non-execution but also offers the promise of superior returns.
Similarly, an investor placing an order on electronic crossing networks (ECN) such as
POSIT.RTM. faces a similar tradeoff. The investor may receive superior trade performance but
risks that the trade will not be executed.

Brief Summary Text (12):
Handa and Schwartz (1996) examine the returns from placing a limit order depending on the
arrival of liquidity or informed counterparty traders. Handa and Schwartz (1996) also
empirically examine the returns for executed and non-executed limit orders. However, whereas
Handa and Schwartz (1996) as well as Copeland and Galai (1983) and others classify traders as
informed or uninformed, and the expected costs and gains are evaluated for a single-security
transaction by a risk neutral trader, the method of the present invention represents the
investor's information in terms of expected return and variance of expected return, rather than
with the dichotomous informed/uninformed framework. This permits more flexibility in
quantifying "information," and it enables the investor to examine the relation between expected
returns, execution probabilities, and returns to various strategies.

Brief Summary Text (24):
Whereas Handa and Schwartz (1996) as well as Copeland and Galai (1983) and others classify
traders as informed or uninformed, and the expected costs and gains are evaluated for a single-
security transaction by a risk neutral trader, the method of the present invention represents
the investor's information in terms of expected return and variance of expected return, rather
than with the dichotomous informed/uninformed framework. This permits more flexibility in
quantifying "information," and it enables the investor to examine the relation between expected
returns, execution probabilities, and returns to various strategies.

Brief Summary Text (25):
The method of the present invention is also unique in modeling the joint distribution between
returns and order execution rates. While several papers evaluate expected gains using an
estimated or theoretical probability of execution, the method of the present invention
maximizes gains using a joint density function. In this manner, the invention enables the
investor to quantify the adverse selection problem associated with uncertain order execution.

Brief Summary Text (32):
At first, assume that the investor faces a simple decision--either buy the security with
certainty at the principal price, or place an order for that security at some discount from the
principal price and hope for full or partial execution. If a principal order is placed, we
assume it is executed at the start of the trade period at time t, at the current principal
price. At the end of the trade period, at time t+1, performance is evaluated based on a
terminal valuation price. The foregoing assumptions are useful for developing the present
method but do not limit the method. In other words, the method of the invention can be employed
outside the scope of these assumptions. Our notation is as follows: w=is the initial wealth of
the investor, i.e., the total wealth of the investor's assets in the portfolio at time t;
p.sub.a,t =principal purchase price of the security at the start of the trade period, adjusted

for splits and dividends; (For equity securities, it is often convenient to maintain a database containing historic prices for various securities of interest. In order to compare prices over time, it is necessary to adjust prices for the occurrences of splits and dividends. For example, if stock XYZ is trading at 150.00 on Jan. 2, 1998, and then splits 2:1 effective Jan. 3, 1998, the number of outstanding shares of the issue doubles, and the price of the stock halves to 75.00. In order to calculate the return over this same period, it is necessary to adjust all the prices preceding the split by a factor of one-half. For dividends, an adjustment is necessary if ownership of the stock at some time between t and t+1, inclusive, implies that a dividend will be received. If a dividend will be received, the terminal price at t+1 must be increased by the dollar amount of the dividend. $p.sub.m,t+1$ =terminal valuation price of the security at the end of the trade period, adjusted for splits and dividends. (In the examples presented herein we use the midpoint of the bid and ask. The principal, offer, or some other price may be substituted, however, according to user preference. In general, the terminal valuation price of the security as used in the invention can be any convenient price that reflects the value of the security at the end of the trade period in question.) .gamma.=the discount, in dollars, from the principal price at which the investor places the order. If .gamma.=0, the investor is executing a principal order at the principal price with certainty of execution; the invention solves for the optimal level of .gamma.. $x(.gamma.)$=A random variable equal to 1 if an order executes, and 0 otherwise. By definition, $x(0)=1$, and $E(x(.gamma..sub.1)).gtoreq.E(x(.gamma..sub.2))$, if $.gamma..sub.1 <.gamma..sub.2$, where the function E is the expected value of the random variable. In another embodiment of the invention, $x(.gamma.)$ is a continuous real number within the interval [0,1]. This embodiment of the invention accounts for situations wherein there is a partial execution of an order; and s is the number of shares of the security being traded. (If the user knows, a priori, that they will be trading small lots of liquid securities, it is reasonable to make the approximation s=1 in all of the equations containing s. Consider again the example of an investor trading 100 shares of IBM. Because this security has such high volume, the sensitivity of optimal order discounts between order sizes of 100 to approx. 5,000 is insignificant, and it is likely that the approximation could be used successfully for even larger order sizes).

Brief Summary Text (36):
Note that in our example, where $p.sub.m,t+1$ is defined as the midpoint of the bid and offer prices at time t+1, there is an inherent negative return approximately equal to half the percentage bid-ask spread. This convention is useful because it enables the investor to evaluate performance at the end of the trade period using not just changes in trade price but changes in spread as well.

Brief Summary Text (40):
In the optional-execution case, unexecuted orders are not completed for the purposes of evaluating trade performance. In this scenario, the return to the unfilled purchase order is zero,

Brief Summary Text (86):
In general, to utilize the present invention, the following are prerequisites: user supplied prices for the securities to be analyzed, including principal price at which the security can be traded with certainty; and terminal valuation price equal to the fair market value of the security at the end of the trading horizon; user supplied probability density function for $x(.gamma.)$, and any supporting data needed to evaluate this probability; user supplied distribution of expected returns to the security over the trade horizon (may be centered at zero, implying no information about future price direction is known); order size; user supplied choice of forced execution or optional execution; and bounds on feasible discount levels for an optimizer to consider.

Brief Summary Text (90):
Using publicly available stock data from the 1996 NYSE Trade and Quote (TAQ) data set and the 1991 NYSE Trade, Orders, and Quote (TORQ) data set, we first calculate asset returns conditional on limit order executions and unconditional limit order fill probabilities. For the months of July and August 1996, we randomly select 100 S&P500 stocks having the NYSE as a primary exchange. We define the trade period to be a 1-day period, as measured from the first quote on day t to the first quote on day t+1. (This choice of trade period is arbitrary, and can be modified by the user to suit personal needs.) Then, using the first offer (bid) quote on day t as our principal price for buys (sells), we test hypothetical buy (sell) limit orders at a discount (premium) varying from 0.5% to 3% of the principal price. (Again, as previously discussed, choice of principal price can be modified to suit the individual user). Discounts

and premiums are rounded to the nearest eighth, unless rounding would cause a zero discount, in which case the discount is rounded to one-sixteenth. (All of our experiments were run with no rounding as well, but the results were not significantly different from those presented in the paper. When stock prices switch to decimal pricing, rounding to discrete ticks will no longer be necessary.)

Brief Summary Text (99):
As expected, we find the coefficients on GAM to be significant and negative, as larger discounts imply a smaller probability of fill. This relationship is, however, highly non-linear, as both GAM2 and GAM3 are significant. The percentage bid-ask spread is positive and significant, possibly because higher spreads are associated with higher volatility (Copeland and Galai, 1983). The coefficient on returns, RET, is negative, as high returns imply a lower probability of filling. The coefficient on squared returns, RET2, is positive and may be considered a proxy for volatility. We tested additional measures of volatility terms but omitted them due to collinearity with squared returns.

Brief Summary Text (122):
In Table 5 we solve for optimal limit order discounts given expected return, standard deviation of return, and varying levels of risk aversion. We assume that returns on the risky asset XYZ, r, are normally distributed with daily standard deviation of 1.6%, which is approximately equal to the actual standard deviation of returns in our sample. (Because actual returns have fatter tails than that given by a normal distribution, a simple estimate of variance based on the untrimmed returns provided a disappointing fit. The variance of the untrimmed distribution was 1.8%. Alternatively, distributions other than the normal could easily be used. The model is sufficiently general that a variety of predictive techniques may be substituted for the simple ones presented here.) In order to demonstrate a variety of optimal limit orders, we vary the expected daily return on the risky asset, r, from -0.8% to 1.2%. These levels correspond to various private beliefs of the investors about the returns of the security. The uninformed investor will have an expected return equal to -0.275%, equal to minus half the bid-ask spread, as buy returns are evaluated from the offer at time t to the midpoint at time t+1. We vary the coefficient of risk aversion from the risk neutral case, .lambda.=0, to a more risk averse .lambda.=0.25. We cap the range of possible limit order discounts at 3% because our conditional density function is estimated over this range.

Detailed Description Paragraph Table (6):
TABLE E2E Forced & Optional Purchase Strategy Returns for 100% fill at touch All returns are a percentage of offer price evaluated at the next day's midpoint. The forced strategy includes the additional cost of purchasing the security if the limit order does not execute. The optional strategy earns zero returns if the limit order does not execute. p-values are calculated using a t-test on the null hypothesis that the means are equal under the assumption of unequal variances. Avg. Average Avg. Return p-value Return Return Forced- for H.sub.0 : Optional - p-value for Market Execution Forced = Execution H.sub.0 : Optional = .gamma. Buy Order Strategy Market Strategy Market 0.5% -0.4052 -0.0860 .0001 -0.0736 .0001 1.0% -0.4052 - 0.0770 .0001 0.0069 .0001 2.0% -0.4052 -0.1652 .0001 0.0373 .0001 3.0% -0.4052 -0.2055 .0001 0.0541 .0001

Detailed Description Paragraph Table (11):
TABLE E3E Forced & Optional Purchase Strategy Returns for 0% fill at touch All returns are a percentage of offer price evaluated at the next day's midpoint. The forced strategy includes the additional cost of purchasing the security if the limit order does not execute. The optional strategy earns zero returns if the limit order does not execute. p-values are calculated using a t-test on the null hypothesis that the means are equal under the assumption of unequal variances. Avg. Average Avg. Return p-value Return Return Forced- for H.sub.0 : Optional - p-value for Market Execution Forced = Execution H.sub.0 : Optional = .gamma. Buy Order Strategy Market Strategy Market 0.5% -0.4052 -0.3232 0.0444 -0.2633 0.0001 1.0% -0.4052 - 0.3199 0.0240 -0.1746 0.0001 2.0% -0.4052 -0.2744 0.0001 -0.0396 0.0001 3.0% -0.4052 -0.2755 0.0001 0.0050 0.0001

Issued US Cross Reference Classification (3):
705/37

Field of Search Class/SubClass (3):
705/37